

Router components

Data plane (Brawn)

forwarding related

control traffic ← { processing related }

- software Based routers

- HW ~ ~

- Hybrid \sim \sim

NSW based routers \rightarrow shared control & data plane

→ general purpose CPU (slow & smart)

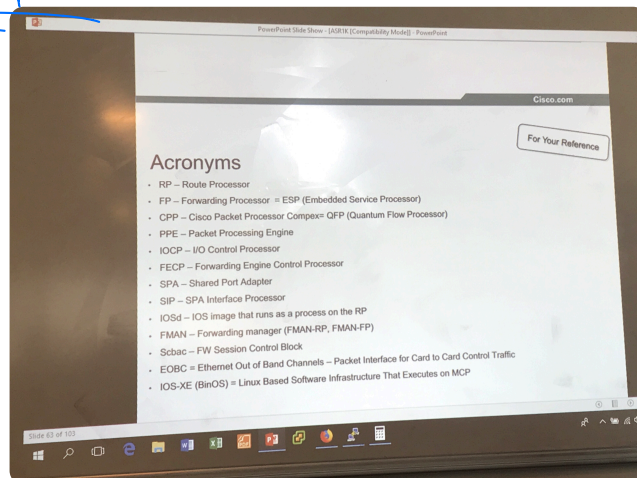
→ CPU responsible for all operations

800/2800/2900/3900/ 7200 series

PFR/OER Load sharing ~~هو~~ طريقة في توزيع
الحملات.

EIGRP (FD/FS)

ASRIK . ppt



Perf: measurement for Bandwidth for
routers [speed test tool]

ixia: best company for test network
ixiacom.com



SDM



مخوف الشبكات



QoS

CSR(conf) # access-list 100 permit ip any any
dscp ef
↳ = 46/48 → ^{الترتيب} ~~الترتيب~~ Voice

(--) # access-list tcp any any range 2000 2999

() # class-map CL-QoS

match access-group 100

do sh class-map

policy-map PL-QoS

class CL-QoS

set

priority 5000

sh policy-map

(conf) # int g2

(Config-if) # service-policy out PL-QOS

sh policy-map int g2

RSVP ⇒ Label للترافيق
تسمح لوضع
بها تسمى فيها لا
فقط و أكثر
لها من 1/4 و 1/2
تجزئ BW

Enabling RSVP

- **Enable RSVP**

- Router(config-if) ip rsvp bandwidth [interface-kbps]
[single-flow-kbps]

- **Disabling Reserving Interface Resources**

- Router(config-if) ip rsvp resource-provider none

- **Disabling Packet Classification**

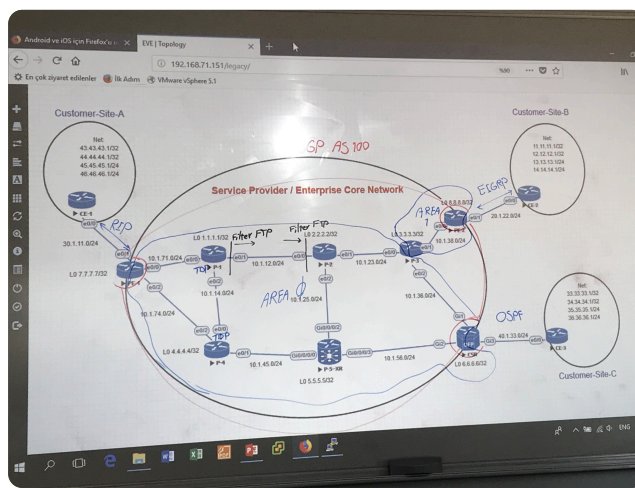
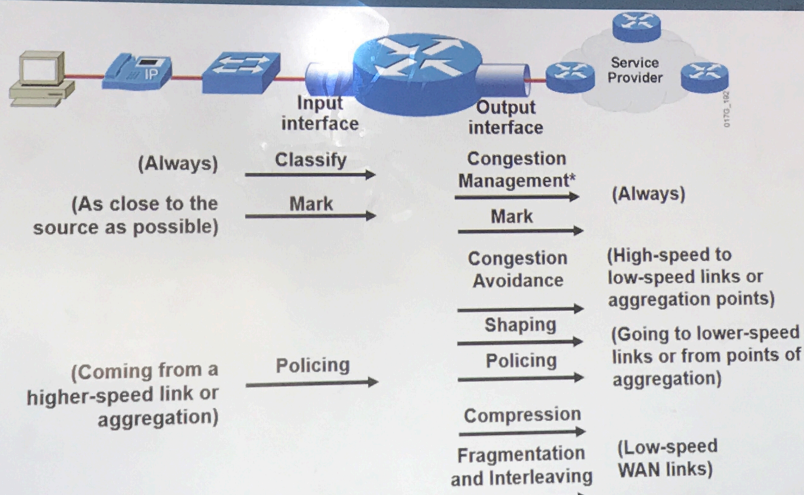
- Router(config-if) ip rsvp data-packet classification
none

QoS Mechanisms

- **Classification:** Each class-oriented QoS mechanism has to support some type of classification.
- **Marking:** Used to mark packets based on classification, metering, or both.
- **Congestion management:** Each interface must have a queuing mechanism to prioritize transmission of packets.
- **Congestion avoidance:** Used to drop packets early to avoid congestion later in the network.
- **Policing and shaping:** Used to enforce a rate limit based on the metering (excess traffic is either dropped, marked, or delayed).
- **Link Efficiency:** Used to improve bandwidth efficiency through compression, link fragmentation, and interleaving.

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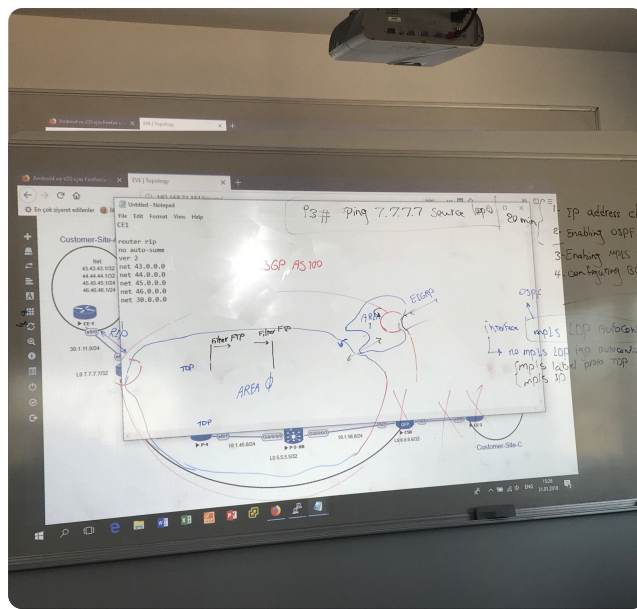
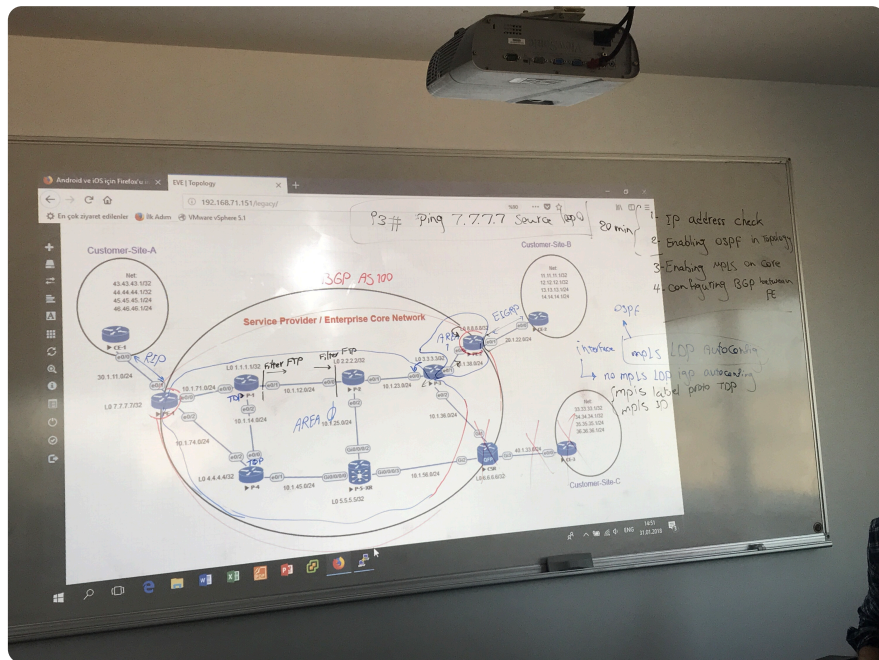
Applying QoS to Input and Output Interfaces

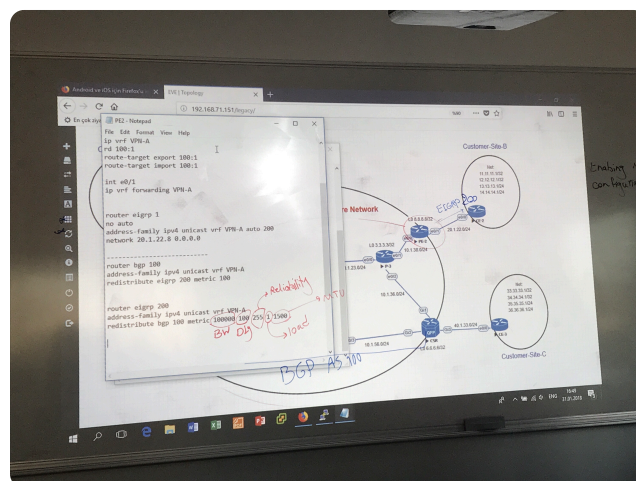
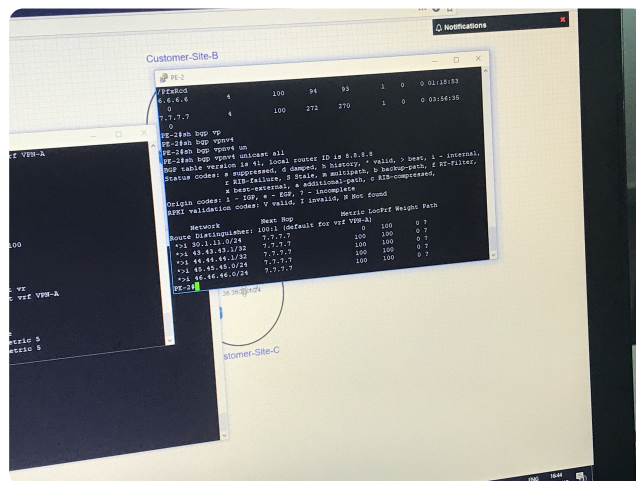
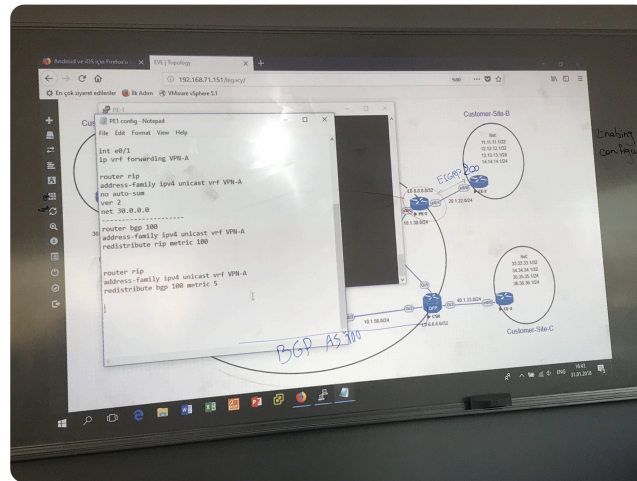
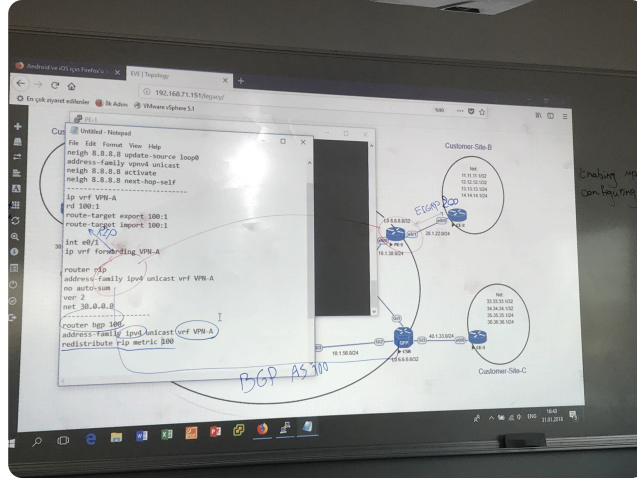


secure mpls connection between routers

P1(config)# mpls ldp neighbor 2.2.2.2 password
cisco

P2(config)# mpls ldp neighbor 1.1.1.1 password
cisco





ASR1000-002-01 • Name. Surname
C → ASR1000
MPLS002-01

alig @ btegitim . com

celi
MPLS

```
PE-1
PE-1#sh bgp vp
PE-1#sh bgp vpmv4 un
PE-1#sh bgp vpmv4 unicast all
BGP table version is 30, local router ID is 7.7.7.7
Status codes: s - suppressed, d - dampened, h - history, * - valid, > best, i - internal,
               * - RIB-failure, S - Stale, m - multipath, b - backup-path, f - RIB-Filter,
               * - best-external, a - additional-path, c - RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V - valid, I - invalid, N - Not found

Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 100:1 (default for vrf VPM-A)
*> 11.11.11.1/32   8.8.8.8           100 1 100 0 ?
*> 12.12.12.1/32   8.8.8.8           100 1 100 0 ?
*> 13.13.13.0/24   8.8.8.8           100 1 100 0 ?
*> 14.14.14.0/24   8.8.8.8           0 32768 ?
*> 20.1.1.0/24     0.0.0.0           100 32768 ?
*> 30.1.1.0/24     30.1.1.1          100 32768 ?
*> 43.43.43.1/32   30.1.1.1          100 32768 ?
*> 45.45.45.1/32   30.1.1.1          100 32768 ?
*> 46.46.46.0/24   30.1.1.1          100 32768 ?
```

```
CE-2
CE-2#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, I - ISIS
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

11.0.0.0/32 is subnetted, 1 subnets
C 11.11.11.1 is directly connected, Loopback0
12.0.0.0/32 is subnetted, 1 subnets
C 12.12.12.1 is directly connected, Loopback1
13.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 13.13.13.0/24 is directly connected, Loopback2
C 13.13.13.1/32 is directly connected, Loopback2
14.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 14.14.14.0/24 is directly connected, Loopback3
C 14.14.14.1/32 is directly connected, Loopback3
--More--
```